

Temperament in the classroom: Children low in surgency are more sensitive to teachers' reactions to emotions

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Abstract

Based on the emotion socialization and bioecological models, the present study examined the contributions of teacher emotion socialization (i.e., teacher reactions to child emotions) on children's social-emotional behaviors, and the moderating effect of child temperamental surgency on these relations in the preschool context. A total of 337 children and 80 teachers from private and public preschools/childcares participated in the study. To account for the nested nature of our data, hierarchical linear modeling (HLM) was utilized. The results indicated that several types of teacher reactions to children's emotions significantly predicted children's social-emotional behaviors, after adjusting for prior levels of the behaviors. In addition, significant interactions between child surgency and teacher emotion socialization behaviors on children's social-emotional behaviors were found. These interactions indicated that children with low surgency were more sensitive to teachers' positive and negative socialization, compared to children with high surgency. Our results highlight the importance of discrete emotion socialization behaviors by teachers to children's social-emotional development.

Keywords

contingent reactions, preschool context, social-emotional behaviors, teacher emotion socialization, temperamental surgency

The emotion socialization perspective states that a socializer's emotion-related behaviors have a significant impact on the development of social-emotional competence (e.g., Denham, Bassett, & Wyatt, 2014; Eisenberg, Cumberland, & Spinrad, 1998). Social-emotional competence is defined as effectiveness in interaction (Rose-Krasnor, 1997). To effectively interact with peers and teachers, preschoolers must demonstrate skilled social-emotional behaviors, such as expressing and regulating positive and negative emotions in a socially appropriate way, and interacting with peers prosocially rather than aggressively (Denham, Bassett, Zinsser, & Wyatt, 2014). In the present study, we observed preschoolers' emotion expression and regulation, as well as social interaction while interacting with peers (i.e., center time, playground) as indices of social-emotional competence.

In the past, most research on emotion socialization involved parents; however, recent research has identified preschool teachers as pivotal facilitators of the development of children's social-emotional competence (Denham, Bassett, & Zinsser, 2012; Pianta & Hamre, 2009). For example, empirical research suggests that a global rating of teachers' emotional support (Curby, Brock, & Hamre, 2013) and teacher-child relationship qualities (Hipson & Séguin, 2015) are related to child social-emotional outcomes. Teachers' overall ability to provide emotionally-supportive classrooms and to form positive relationships with children create an important environment for healthy social-emotional development, whereas teachers' discrete emotion socialization behaviors provide children a targeted learning opportunity about specific social-emotional behaviors. However, to our knowledge, the relation of teachers' discrete emotion socialization behaviors to child social-emotional development has not yet been explored. By examining micro-levels of teachers' emotion socialization behaviors in the

classroom, we will further our understanding of the mechanism of socialization in preschool. Such information is also useful for detailed recommendations for preschool teachers. Therefore, the first goal of the present study focused on the contribution of teachers' emotion socialization behaviors to children's social-emotional behaviors in the preschool context.

Socialization behaviors, however, may differentially predict social-emotional outcomes depending on children's characteristics (e.g., temperament). According to the bioecological model (Bronfenbrenner & Morris, 2006), children's development takes place through increasingly complex, regularly occurring, reciprocal interactions between children and other people, objects, and ideas in their immediate environment. Such interactions are referred to as proximal processes. These proximal processes include teacher-child interactions in preschool settings. The effect of such proximal processes on children's development varies as a joint function of person (e.g., child), context (e.g., settings), and time. In the present study, we especially focused on how characteristics of the developing *person* (i.e., child temperament) affect the relation between teacher-child affective interactions (proximal processes) and children's social-emotional behaviors with peers. Accordingly, this study's second goal is to examine moderating effects of child temperament on the relations between teachers' emotion

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socialization and child social–emotional behaviors in the preschool classroom.

Emotion socialization and social–emotional development: Teachers' role

According to the emotion socialization theory, socializers' contingent reactions to specific emotions may help young children learn social–emotional behaviors appropriate in the culture (e.g., Denham, Bassett, & Wyatt, 2014; Eisenberg et al., 1998). Adults may respond to children's experience and expression of emotions in supportive (e.g., accepting, comforting), or unsupportive ways (e.g., ignoring, minimizing, punishing). These socializers' reactions to children's emotions convey important messages regarding expression and regulation of emotions. Empirical findings show significant relations between parental reactions to toddlers' and preschoolers' emotions and their social–emotional competence. For example, mothers' supportive reactions to children's emotions positively relate to preschoolers' expressiveness of positive emotions (Fabes, Poulin, Eisenberg, & Madden-Derdich, 2002) and emotion regulation (Spinrad, Stifter, Donelan-McCall, & Turner, 2004). In contrast, parents who employ unsupportive reactions to emotion are more likely to have sadder, more fearful children (Berlin & Cassidy, 2003) and children with diminished emotion regulatory abilities (Luebbe, Kiel, & Buss, 2011).

During the preschool age period, however, contexts outside the family become important. Preschool is rich in emotional experiences, and young children learn about emotions through daily interactions with teachers and peers. In addition, even when children are not directly involved in an interaction, they can learn about social and emotional norms in the classroom through observing social–emotional behaviors of peers and teachers. These experiences in the classroom assist children in acquiring social–emotional competence. To become socially–emotionally competent, children must learn the skills that enable them to effectively interact with others (Rose-Krasnor, 1997). These skills are demonstrated with appropriate expression and regulation of emotions, cooperation with others, and use of prosocial strategies to solve conflicts.

Therefore, preschool is an important context for young children's social–emotional development. Emerging research especially focuses on preschool teachers' role; for example, high levels of teacher emotional support are related to better social–emotional outcomes for children (Curby, Brock, & Hamre, 2013; Howes et al., 2008; Mashburn et al., 2008). These studies, however, focus on teachers' overall abilities to provide an emotionally supportive environment in the classroom, and have not examined their discrete emotion socialization behaviors. Early childhood education research indicates that preschool teachers are likely to engage in a wide variety of discrete emotion socialization behaviors in the classroom, parallel to parental emotion socialization behaviors (Ahn & Stifter, 2006; Ersay, 2007). Teachers whose classrooms are rated as equally emotionally supportive may have different styles of reacting to children's emotions. For example, in an emotionally supportive classroom, a teacher may respond in an empathic way to validate children's distressed emotions, or may help children come up with solutions to distressing situations. Different types of reactions may send different socialization messages to children in the classroom, about specific emotions and emotion-related behaviors. Children in the first example may learn much about prosocial reactions to others, whereas those in the second may learn

much about solving social problems with skill—two different social–emotional competencies. Thus, in addition to a global rating of teachers' emotional support, it is important to examine how teachers' discrete emotion socialization behaviors are related to children's development of social–emotional competence.

Temperamental surgency

Temperament refers to an inherited disposition that is linked to individual differences in emotional and behavioral reactivity and regulation (Rothbart & Bates, 2006). As such, temperament plays a key role in the bioecological perspective. One widely accepted and empirically supported model conceptualizes temperament as three broad clusters: two reactive factors (surgency and negative affectivity) and one regulatory factor (effortful control) (Rothbart & Putnam, 2002). Among the temperamental factors, surgency is associated with an approach/withdraw tendency to a novel situation, energy activation, and sociability (Rothbart & Bates, 2006). Low-surgency children are apprehensive toward new people and events in the environment. Because they are likely to experience anxiety in novel situations (Hipson & Séguin, 2015), these children tend to display cautious behaviors. They tend to be shy and socially withdrawn, or quietly observe unfamiliar children in a social situation (Kagan, Snidman, Arcus, 1998). Heightened anxiety in novel situations may lead them to become vigilant and more responsive to socializers' behaviors (Kochanska, 1997). In fact, surgency is one of child characteristics which is hypothesized to explain sensitivity to socialization behaviors (Belsky, 2005). In contrast, high-surgency children can be characterized as highly active and constantly exploring their environment with relative disregard for rules and regulations on their behavior (Berdan, Keane, & Calkins, 2008). They are sociable and spend more time in interactions rather than observing other children (Kagan et al., 1998). Individual differences in surgency are related to the frequencies of teacher–child interactions in preschool. Specifically, Rudasill and Rimm-Kaufman (2009) found that low-surgency children interacted less with their teacher in the classroom, compared to high-surgency children.

Hence, it can be assumed that low-surgency children spend more time observing other children's and teacher's behaviors and interactions, rather than interacting with others in the classroom. As the social cognitive theory stated (Bandura, 1989), learning can occur through observation. In addition, low-surgency children's likely experience of heightened anxiety in novel situations may enhance sensitivity to teacher socialization behaviors in the classroom. In contrast, high-surgency children are more likely to enjoy social interaction with their peers and teacher rather than observing others' behaviors. These differences in behavioral and physiological tendencies may be related to how much children learn from teachers' emotion socialization behaviors about the appropriateness or inappropriateness of social–emotional behaviors.

The present study

In the present study, we focused on young children's social–emotional competence in the preschool context. Specifically, we examined (1) how teachers' discrete emotion socialization behaviors (i.e., contingent reactions) observed in the middle of the school year (winter) predicted children's social–emotional behaviors with peers in the second half of the school year (spring), and (2) how

children's level of temperamental surgency moderate these relations. To have a better understanding of how teacher emotion socialization was related to preschoolers' social-emotional development, we included scores of children's social-emotional behaviors in the early part of the school year (fall) to partial out prior levels of social-emotional behaviors. In addition, because social-emotional behaviors may differ according to age and gender, we included these variables as covariates in the models. Specifically, emotion and behavior regulation are often found to increase with age during preschool years (Epstein, Synhorst, Cress, & Allen, 2009). As for gender differences, some research shows that emotion and behavior regulation skills are greater for girls than boys (Epstein et al., 2009). Girls are also found to show more prosocial and peer skills, whereas boys are found to be more aggressive (Romano, Tremblay, Boulerice, & Swisher, 2005).

Based on the findings of parental socialization research, we expected that teachers' contingent reactions predict children's social-emotional behaviors after adjusting for prior levels of social-emotional behaviors. We hypothesized that supportive teacher reactions would be positively related to children's positive aspects of social-emotional behaviors and negatively related to negative aspects of social-emotional behaviors. In contrast, unsupportive teacher reactions would be negatively related to children's positive aspects of social-emotional behaviors and positively related to negative aspects of social-emotional behaviors. Because of differences in behavioral and physiological tendency between low- and high-surgency children, we further hypothesized that low-surgency children would be more sensitive to teacher socialization behaviors. Specifically, we expected stronger relations between teachers' reactions to emotions and the changes on their social-emotional behaviors for low-surgency children, compared to high-surgency children.

Method

In the present study, 337 children (54% male; $M_{\text{age in months}} = 48.35$, $SD_{\text{age in months}} = 7.14$) and 80 teachers (100% female; $\text{Mode}_{\text{age range}} = 25\text{--}35$ years) were drawn from a longitudinal study of teacher socialization of social-emotional competencies in preschool. Participating children were 75% Caucasian, 16% African American, 8% Asian, and 1% American Indian/Alaskan Native or Native Hawaiian/other Pacific Islander. The majority of participants was non-Hispanic (81%) and spoke English as their primary language (84%; Spanish 8%). The mode education level of parents who provided demographic information was some college education. The group of participating teachers was 60% Caucasian, 19% African American, 6% Asian, and 15% other or not reported; 83% self-identified as non-Hispanic. The mode education level of teachers was bachelor's degree.

Of the total, 228 children and 75 teachers were included in the analyses due to missing data. Missing data were due to parents not filling questionnaires (27.9% missing), children moving (8.0% missing), and teachers leaving the center (2.5% missing). Analyses revealed no significant mean differences on any study variables between children/teachers included in the analyses and excluded from the analyses.

Procedures

Participants were recruited at the beginning of the academic school year from 22 private childcare and two Head Start centers in

Northern Virginia, USA. After meeting with a director of each center, we obtained consent from participating teachers. Then, children and families in these teachers' classrooms were recruited at recruitment events held at child pick-up, information sessions held at the facilities, and/or through the help of facility social workers and directors. After receiving consent from parents, we asked parents to fill several questionnaires including demographic information, child temperament, and parental emotion socialization. Only demographic and child temperament questionnaires were used in this study.

Child data were collected twice—in the first half of the school year (fall, T1) and in the second half of the school year (spring, T2), approximately 5 months apart. In each data collection period, we observed children's social-emotional behaviors during peer interactions for 5-minute intervals across 4 different days. Teachers' emotion socialization behaviors in the classroom were observed for eight 10-minute sessions across 4 different days between the two times of child assessment (i.e., in the winter).

Measures

Observation of children's socio-affective behaviors. The Minnesota Preschool Affect Checklist-Revised/Shortened (MPAC-R/S; Denham, Bassett, Zinsser, & Wyatt, 2014) is an 18-item observational measure assessing children's social-emotional behaviors (i.e., emotional expression, emotion regulation, and social skills) during interaction with peers. In using the MPAC-R/S, children's behaviors are observed in differing play and interaction contexts, and coded for presence ("1") or absence ("0") of predefined behaviors during 5-minute intervals across 4 different days. Coders were encouraged to observe during less structured periods (i.e., center time, outside recess, gym, as opposed to teacher-led instructional time). The items in MPAC-R/S are organized into scales for positive (3 items: showing a positive affect in any manner; facial, vocal, and/or behavioral) and negative (2 items: showing a negative affect in any manner) affect, productive (2 items: e.g., engrossed in the ongoing activity) and unproductive (2 items: e.g., being listless) involvement in age-appropriate activities, positive reactions to frustration (2 items: e.g., when facing with a conflicts, verbally expressing frustration in a positive or neutral manner), social skills (4 items: e.g., joining, cooperating with peers, taking turns), and aggressive behaviors (3 items: e.g., venting frustration toward people or objects). Thus, the MPAC-R/S taps important elements of social-emotional functioning; the variety of behaviors sampled yields a richness of the information regarding children's social-emotional behaviors, achieved in four short observations. Each item score was calculated by summing across visits. Because the number of items varied across scales, calculating the mean of the scales yielded a total score for each scale (possible range = 0–4).

Observer training consisted of multiple sessions, from learning the definitions of each target behavior to coding children's behaviors in practice videos as a group and individually. At the end of the training, each observer coded children's behaviors in 22 reliability videos. Good to excellent inter-observer reliability was indicated by the intraclass correlation that ranged from .74 (negative affect scale) to .98 (emotion regulation scale).

In the present study, because we focused on children's social-emotional behaviors with peers, we excluded the scales capturing child level of productivity in age-appropriate activities (i.e., productive and unproductive involvement). Thus, scales used in the

present study included positive affectivity, social skills, negative affectivity, aggressive behaviors, and emotion regulation. To reduce the number of outcome variables, we conducted principal component analyses (Promax with Kaiser Normalization) for T1 and T2 separately. Three identical principal components, which reflected the skilled social-emotional behaviors needed for effectively interacting with others, emerged across the two times of observation (74% and 77% of variance explained at T1 and T2, respectively): (1) emotionally negative/aggressive (negative affect, aggressive behaviors), (2) emotionally positive/socially skilled (positive affect, social skills), and (3) emotionally regulated (positive reactions to frustration). The factor scores were created by taking the mean of items that loaded highly on each factor. Cronbach's alphas showed acceptable to good internal consistency for the factors: emotionally negative/aggressive (5 items) = .68, .75, emotionally positive/socially skilled (7 items) = .61, .61, and emotionally regulated (2 items) = .81, .82 for T1 and T2, respectively.

Observation of teacher reactions to children's emotions. Using FOCAL-T (Denham & Bassett, 2013), we observed teachers interacting with children in their classroom during regular activities for eight 10-minute sessions over a period of approximately 6 weeks, during circle time, center time, and lunch. FOCAL-T is designed to capture preschool teachers' discrete emotion socialization behaviors: expression of discrete emotions and reactions to children's emotions. Teachers are observed in their classroom setting by coders using tablet computers and software developed by Roberts (2011). For each teacher, there were eight 5-minute trials with the teacher as focal person, counting his/her expressed emotions and children's reactions, alternating with eight 5-minute trials with children as focal person(s) counting children's emotions toward the teacher and the teacher's reactions to their emotions. Because our focus was a teacher's emotion socialization behaviors in the classroom, observations were not done with any specific teacher-child dyads.

Focal emotions included (1) happy, (2) sad, (3) angry, (4) tense, (5) tender, (6) pain, (7) other, and (8) neutral. Two types of reactions to focal persons were coded: behavioral and emotional reactions. Behavioral reactions included (1) punitive reactions (e.g., threaten a child for showing emotion), (2) problem-focused reactions (e.g., help a child solve an emotion eliciting problem), (3) emotion-focused reactions (e.g., try to make a child feel better), (4) validating reactions (e.g., acknowledge a child emotion), (5) minimizing reactions (e.g., tease a child for expressing emotion), and emotional reactions included, (6) distress reactions (e.g., show frustration to a child emotion), (7) matching positive reactions (e.g., smile back to a smiling child). Observers enter the focal person's emotion's code at its onset, and then enter reactions to each emotion as these occur (reactions are considered mutually exclusive, but can be coded successively), and then look back to the focal person/group. If the same emotion continues, reactions are again sought; if no emotion is being displayed, the observer enters the "neutral" code. When teachers are not focal persons, coding begins with an emotion expressed by *any* child in the group within three feet of the teacher.

Intensive training was required to become a reliable FOCAL-T coder. After learning the definitions of the emotion and reaction codes, trainees took a written reliability test, in which they were asked to assign an emotion or reaction code to short scenarios describing teacher-child emotional interactions in the classroom. After passing the written reliability test with 80% or more accuracy

in coding, the trainees coded practice videos in a group and individually. At the end of the training, they coded three reliability videos and their coding was compared to master coder's coding to calculate inter-observer reliability. Inter-observer reliability was $\kappa = .85$ for emotions and $.67$ for reactions. Before starting data collection, observers had to pass live reliability, for which a paired observers live-coded teacher's and children's emotions and reactions in a classroom ($\kappa = .74$ for emotions and $.85$ for reactions).

The number of each observed teacher emotion and reaction were aggregated across sessions. For teacher emotions, we divided each emotion by the total number of teacher's expressed emotion during observations to give a proportion of each emotion relative to expressed emotions by the teacher. For teacher reactions, the aggregates were divided by the number of child emotions to give a proportion of each response relative to emotions shown.

Because we specifically focused on the relations between a type of teacher reactions to children's emotions and their social-emotional development, only teacher reactions were used in the present study. To reduce the number of teacher-level predictors, a principal component analysis (Promax with Kaiser Normalization) was performed with behavioral reactions. The result yielded three types of behavioral reactions: (1) Unsupportive Reactions (punitive reactions + minimizing reactions), (2) Supportive Reactions (problem-focused reactions + emotion-focused reactions), and (3) Validating Reactions (validating reactions). The three factors explained 50% of variance. In addition, we created Positive Reactions (positive reactions-distressed reactions), as a type of emotional reactions. Similar components of reactions and emotions were found in observed (Denham & Kochanoff, 2002) and self-reported (Spinrad et al., 2007) parental emotion socialization behaviors.

Because there were too few items on each scale for Cronbach's alpha to necessarily be meaningful (Spiliotopoulou, 2009), the mean inter-item correlation was examined as an indicator of internal consistency. Mean inter-item correlations showed an acceptable scale reliability ($r = .28$ for positive reactions to $.29$ for unsupportive reactions). According to Clark and Watson (1995), a mean inter-item correlation above $.14$ is considered to be acceptable.

Child temperament. Parents reported on children's temperament with the Child Behavior Questionnaire-Very Short Form (CBQ-VSF; Putnam & Rothbart, 2006), yielding scales of effortful control, negative affect, and surgency. The CBQ-VSF includes 36 items on which parents report on questions about their children's typical reactions to different situations in the past 6 months. These questions are answered using a seven-point Likert-type scale on which 1 = *never*, 4 = *about half the time*, and 7 = *always*. In previous work, the consistency in factor structure across the life span is remarkable (Putnam, Sanson, & Rothbart, 2002) and the CBQ-VSF specifically has shown adequate stability throughout preschool (Putnam & Rothbart, 2006). In this study, only the surgency scale (Cronbach's $\alpha = .72$) was used.

Data analysis

To account for the nested nature of the data, hierarchical linear modeling (HLM; Raudenbush & Bryk, 2002) was used to test our research questions with HLM 6.0 software. In order to estimate the amount of variance at the child and teacher levels, as a first step, unconditional HLM models were analyzed that accounted only for

the nested nature of the data. Then, Model 1 with Level 1 and Level 2 predictors was run. In this model, surgency was group-mean centered in Level-1 and grand-mean centered in Level-2 to account for both within- and between-classroom variance. Other predictors were entered as grand-mean centered. Model 1 can be represented by the following equations:

Level-1 Model 1

$$Y_{ij} = \beta_0 + \beta_1(\text{SURGENCY}) + \beta_2(\text{MALE}) + \beta_3(\text{AGE}) \\ + \beta_4(\text{SOCIAL} - \text{EMOTIONAL BEHAVIORS at T1}) + r_{ij}$$

Level-2 Model 1

$$\beta_0 = \gamma_{00} + \gamma_{01}(\text{POSITIVE REACTIONS}) \\ + \gamma_{02}(\text{UNSUPPORTIVE REACTIONS}) \\ + \gamma_{03}(\text{SUPPORTIVE REACTIONS}) \\ + \gamma_{04}(\text{VALIDATING REACTIONS}) + \gamma_{05}(\text{SURGENCY}) + u_0$$

This model examines our first research question: main effects of teacher contingent reactions to child emotions. The Level-1 equation models within-class variance based on children's characteristics. Thus, for child i in classroom j , the expected outcome, Y , is equal to the classroom average for that outcome, β_0 ; plus an effect for the child's surgency, β_1 ; plus an effect for the child's gender, β_2 ; plus an effect for the child's age, β_3 ; plus an effect for the child's social-emotional behaviors at T1, β_4 ; plus error, r_{ij} . The Level-2 equation models between-classroom variance using teachers' reactions and surgency (classroom average) as predictors. Thus, the classroom average, β_0 , is equal to a grand average, γ_{00} ; plus effects for types of teacher reactions, γ_{01} to γ_{04} ; plus effects for surgency (classroom average), γ_{05} ; plus error, u_0 . In addition, the slope of outcome on surgency, β_1 , is equal to the grand average, γ_{10} .

Model 2 is identical to Model 1 except that the model included cross-level interactions between surgency and types of teacher reactions to address our second research question.

Level-2 Model 2

$$\beta_1 = \gamma_{10} + \gamma_{11}(\text{POSITIVE REACTIONS}) \\ + \gamma_{12}(\text{UNSUPPORTIVE REACTIONS}) \\ + \gamma_{13}(\text{SUPPORTIVE REACTIONS}) \\ + \gamma_{14}(\text{VALIDATING REACTIONS})$$

Thus, in Model 2, the slope of outcome on surgency, β_1 , is equal to a grand average, γ_{10} ; plus effects for types of teacher reactions, γ_{11} to γ_{14} . For a significant cross-level interaction, procedures outlined by Preacher, Curran, and Bauer (2006) were utilized to test whether any of the simple slopes is significantly different from zero. The simple slopes were calculated using an online calculator for probing HLM 2-way interactions (Preacher, Curran, & Bauer, 2004).

Results

Means and standard deviations for all variables and correlations are presented in Table 1. Notably, children averaged mid-range levels of surgency, with good variability across its 7-point scale. As indicated by the means, our teachers were more likely to show emotional reactions (i.e., positive reactions) than behavioral reactions. As for the outcome variables, on average, children showed more positive/socially skilled behaviors than negative/aggressive and emotionally regulated behaviors at both T1 and T2. Child positive/socially skilled and negative/aggressive behaviors had

significant correlations between T1 and T2, suggesting these behaviors were somewhat stable. Teacher positive reactions showed a significant negative correlation with unsupportive and supportive reactions.

Unconditional multilevel models

To calculate a variance component for each level, an unconditional model was tested for each outcome. By dividing the amount of classroom-level variance by the total variance, we computed an intraclass correlation (ICC). The variance at each level and the ICCs for each outcome are presented in Table 2. According to the ICCs, classroom context accounted for 9%, 21%, and 5% of the T2 variance in children's emotionally positive/socially skilled, emotionally negative/aggressive, and emotionally regulated behaviors, respectively. The random effect at classroom-level was not significant for children's emotionally regulated behaviors. Due to the exploratory nature of the study, the low-powered nature of these random effects tests, and for consistency's sake, we included this outcome in the further tests of the effects of level-2 predictors, including the moderation effect of child temperamental surgency.

Conditional models

In Model 1, we examined main effects of child-level and teacher-level predictors on each outcome (Table 2). Subsequently, teacher reactions were added to the slope of surgency to create cross-level interactions as Model 2.

Child-level predictors. Child age negatively and gender positively predicted emotionally negative/aggressive behaviors at T2, indicating younger children and boys showed more emotionally negative/aggressive behaviors compared to older children and girls. As for emotionally positive/socially skilled and emotionally negative/aggressive behaviors, corresponding T1 scores significantly positively predicted T2 scores. However, emotionally regulated behaviors at T1 did not significantly predict T2 scores. In addition, temperamental surgency was not a significant predictor of children's social-emotional behaviors.

Teacher-level predictors. On this level, various types of teacher reactions to emotions showed a significant relation with children's social-emotional behaviors with peers (Table 2). Specifically, teacher unsupportive reactions significantly negatively predicted all three factors of children's social-emotional behaviors at T2. Teacher supportive reactions significantly positively predicted children's emotionally negative/aggressive and emotionally regulated behaviors at T2, whereas teacher validating reactions significantly negatively predicted these aspects of social-emotional behavior. Interestingly, teacher positive reactions did not significantly predict children's social-emotional behaviors at T2.

Cross-level interaction effects. In Model 2, we found several significant cross-level interaction effects between a type of teacher reactions and children's surgency (Table 2). Teacher positive reactions significantly interacted with child surgency to predict children's emotionally negative/aggressive behavior at T2 (Figure 1) and emotionally regulated behaviors at T2 (Figure 2). Test of simple slopes indicated that teacher positive reactions significantly negatively predicted children's emotionally negative/aggressive behaviors at T2 only for low-surgency children. Teacher

Table 1. Descriptive statistics and zero-order correlations for studied variables.

Variable	N	Mean	SD	MIN	MAX	1	2	3	4	5	6	7
Child variables												
1. Child age (months)	228	48.71	7.17	35.00	60.00	—						
2. Surgency	228	4.60	0.82	2.08	6.50	-.09	—					
3. Positive/Socially skilled T1	228	1.60	0.50	0.00	2.63	.02	.02	—				
4. Negative/Aggressive T1	228	0.51	0.53	0.00	2.17	-.13*	.02	-.00	—			
5. Emotionally Regulated T1	228	0.61	0.67	0.00	3.00	-.06	.05	.05	.38***	—		
6. Positive/Socially skilled T2	228	1.67	0.47	0.00	2.83	.07	.06	.23***	-.02	.08	—	
7. Negative/Aggressive T2	228	0.52	0.53	0.00	2.67	-.14*	-.04	-.03	.26***	.14*	-.03	—
8. Emotionally regulated T2	228	0.47	0.64	0.00	2.50	-.03	.00	-.03	.12*	-.02	.00	.36***
Teacher variables												
1. Positive reactions	75	0.39	0.17	0.09	0.82	—						
2. Unsupportive reactions	75	0.05	0.05	0.00	0.20	-.23*	—					
3. Supportive reactions	75	0.09	0.06	0.00	0.30	-.24*	-.03	—				
4. Validating reactions	75	0.07	0.06	0.00	0.25	-.11	-.08	.22 ⁺	—			
Surgency (classroom average)	75	4.59	0.54	2.92	6.42	.20 ⁺	.20 ⁺	.01	-.18			

Note. ⁺ $p < .10$; * $p < .05$; *** $p < .001$.

Table 2. Results of hierarchical linear modeling analyses.

	Positive/Socially skilled T2		Negative/Aggressive T2		Emotionally regulated T2	
Classroom variance (Intercept)	0.02		0.06		0.02	
Child variance (Level 1 effects)	0.20		0.22		0.39	
Total variance	0.22		0.28		0.41	
ICC	.09		.21		.05	
$\chi^2(74)$	102.13*		133.15***		82.19	
	b (95% CI)	p	b (95% CI)	p	b (95% CI)	p
Model 1. Level 1 fixed effects						
Intercept	1.70 (1.63, 1.78)	.000	0.46 (0.38, 0.53)	.000	0.54 (0.43, 0.65)	.000
Age	0.01 (−0.00, 0.01)	.194	−0.01 (−0.02, −0.00)	.034	−0.01 (−0.02, 0.00)	.107
Male	−0.07 (−0.19, 0.05)	.251	0.13 (0.03, 0.23)	.013	−0.15 (−0.31, 0.02)	.083
Surgency	0.04 (−0.03, 0.12)	.267	−0.05 (−0.13, 0.03)	.201	−0.03 (−0.15, 0.09)	.619
Positive/Socially skilled T1	0.24 (0.13, 0.35)	.000	—	—	—	—
Negative/Aggressive T1	—	—	0.21 (0.07, 0.36)	.005	—	—
Emotionally regulated T1	—	—	—	—	−0.03 (−0.16, 0.10)	.642
Model 1. Level 2 fixed effects						
Positive reactions	−0.02 (−0.06, 0.02)	.379	−0.05 (−0.09, 0.00)	.064	−0.01 (−0.06, 0.05)	.775
Unsupportive reactions	−0.07 (−0.11, −0.03)	.002	−0.06 (−0.11, −0.01)	.030	−0.05 (−0.10, −0.01)	.028
Supportive reactions	0.01 (−0.02, 0.05)	.431	0.08 (0.05, 0.11)	.000	0.05 (0.01, 0.09)	.016
Validating reactions	−0.01 (−0.08, 0.05)	.662	−0.11 (−0.17, −0.04)	.002	−0.15 (−0.23, −0.06)	.001
Surgency (classroom average)	0.09 (−0.04, 0.23)	.188	−0.04 (−0.19, 0.11)	.573	0.06 (−0.10, 0.23)	.460
Model 2. Cross-level interaction effects						
Positive react x Surgency	−0.04 (−0.10, 0.11)	.171	0.06 (0.01, 0.11)	.031	0.10 (0.05, 0.16)	.001
Unsupportive react x Surgency	0.02 (−0.02, 0.06)	.384	−0.03 (−0.00, 0.06)	.067	0.07 (0.01, 0.13)	.033
Supportive react x Surgency	−0.03 (−0.09, 0.03)	.289	0.01 (−0.06, 0.08)	.715	−0.05 (−0.13, 0.04)	.298
Validating react x Surgency	−0.03 (−0.13, 0.08)	.654	0.09 (−0.02, 0.21)	.104	0.15 (0.03, 0.28)	.019
Random effects (based on Model 1)						
Classroom variance (Intercept)	Var	df	χ^2	Var	df	χ^2
Classroom variance (Intercept)	0.02	69	87.68 ⁺	0.03	69	93.63**
Child variance (Level 1 effects)	0.19			0.21		
Random effects (based on Model 2)						
Classroom variance (Intercept)	Var	df	χ^2	Var	df	χ^2
Classroom variance (Intercept)	0.02	69	89.04 ⁺	0.03	69	95.38**
Child variance (Level 1 effects)	0.19			0.20		

Note. Variable was centered for analysis; ⁺ $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$. $N = 228$ children (Level 1) and 75 teachers (Level 2). Degree of freedoms for Model 1 Level 1 fixed effects = 218, for Model 1 Level 2 fixed effects = 69, for Model 2 Cross-level interaction effects = 214.

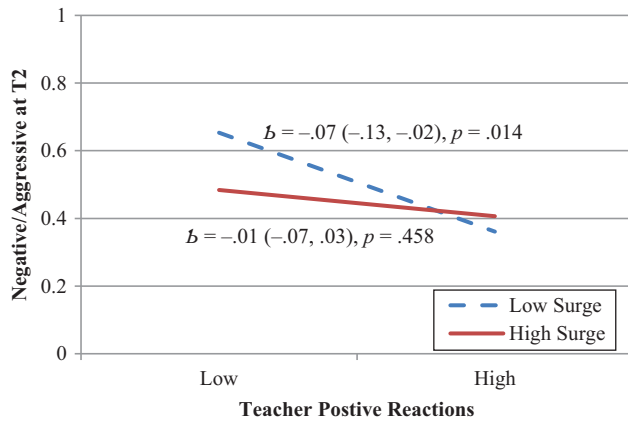


Figure 1. Moderation of child temperamental surgency on teacher positive reactions and child emotionally negative/aggressive behaviors at T2; 95% Confidence Interval in brackets. $N = 228$ children and 75 teachers.

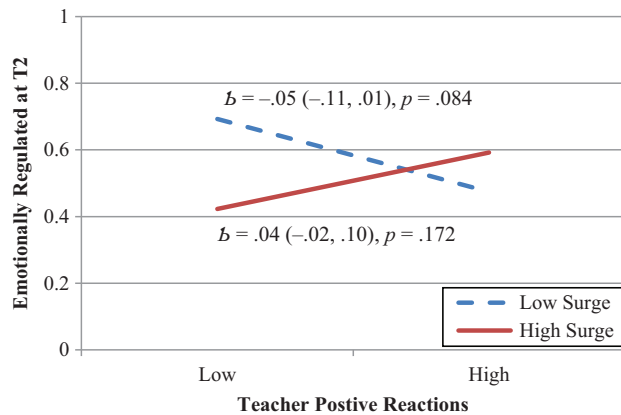


Figure 2. Moderation of child temperamental surgency on teacher positive reactions and child emotionally regulated behaviors at T2; 95% Confidence Interval in brackets. $N = 228$ children and 75 teachers.

unsupportive reactions significantly interacted with child surgency on children's emotionally regulated behaviors (Figure 3) at T2, in which teacher unsupportive reactions significantly negatively predicted this outcome only for low-surgency children. Although marginally significant, teacher unsupportive reactions also interacted with child surgency to predict emotionally negative/aggressive behaviors (Figure 4) at T2, in which only low-surgency children showed a significant negative relation between teacher unsupportive reactions and emotionally negative/aggressive behaviors. In addition, a significant interaction effect was found between teacher validating reactions and child surgency on children's emotionally regulated behaviors at T2 (Figure 5). Again, the result of simple slope test indicated that teacher validating reactions significantly negatively predicted children's emotionally regulated behaviors at T2 only for low-surgency children. In sum, our results indicated that low-surgency children were more sensitive to both positive and negative types of teacher reactions on their social-emotional behaviors.

Discussion

In accordance with both emotion socialization (Denham, Bassett, & Wyatt, 2014; Eisenberg et al., 1998) and bioecological models

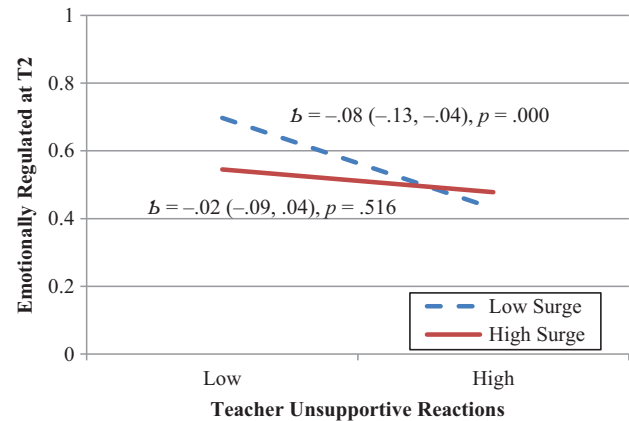


Figure 3. Moderation of child temperamental surgency on teacher unsupportive reactions and child emotionally regulated behaviors at T2; 95% Confidence Interval in brackets. $N = 228$ children and 75 teachers.

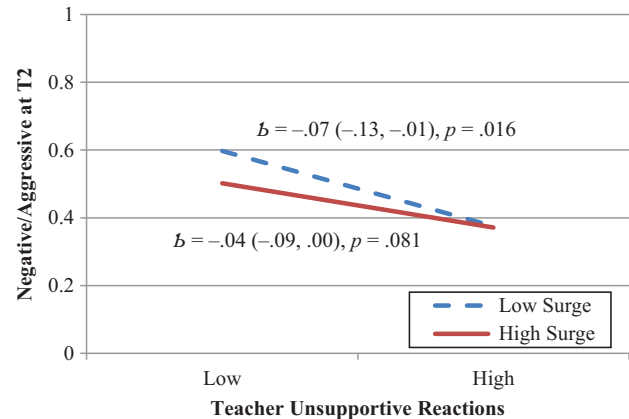


Figure 4. Moderation of child temperamental surgency on teacher unsupportive reactions and child emotionally negative/aggressive behaviors at T2; 95% Confidence Interval in brackets. $N = 228$ children and 75 teachers.

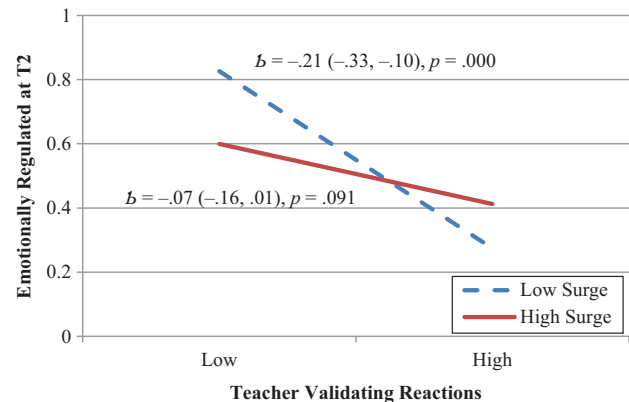


Figure 5. Moderation of child temperamental surgency on teacher validating reactions and child emotionally regulated behaviors at T2; 95% Confidence Interval in brackets. $N = 228$ children and 75 teachers.

(Bronfenbrenner & Morris, 2006), the present study examined how preschool teachers' emotion socialization related to *change* in

children's social-emotional behaviors, and how the relations were moderated by child temperamental surgency. To our knowledge, this is the first study examining the relations between preschool teachers' discrete emotion socialization behaviors and children's development of social-emotional competence. Examining how teachers' specific behaviors relate to the development of child social-emotional competence is beneficial for research and practice, as it extends a growing knowledge based on more global ratings.

Our results indicated that, as with parents, preschool teachers are significant socialization agents for young children's social-emotional development. Furthermore, teacher socialization showed a different magnitude of influence on children's social-emotional development depending on child temperamental characteristics. Specifically, low-surgency children were observed as more sensitive to teacher contingent reactions to children's emotions.

In the following sections, we first discuss teacher emotion socialization and child development of social-emotional competence. Then, we discuss how child temperamental characteristics moderate the relations between teacher emotion socialization and child social-emotional behaviors.

Teacher emotion socialization: Contingent reactions to children's emotions

Consistent with previous literature on the pivotal role that parents play in children's development, the present study supports the important contribution of preschool teachers on children's social-emotional competence. Our results, however, yielded somewhat different patterns of associations in studies of parental emotion socialization. Findings consistent with parental socialization literature were that (1) children displayed more positive social-emotional behaviors at T2 relative to T1 when they had teachers who displayed fewer unsupportive reactions to emotion, (2) children displayed less negative social-emotional behaviors at T2 relative to T1 when their teacher tended to validate their emotions, and (3) children demonstrated more emotionally regulated behaviors at T2 relative to T1 when they had teachers who employed more supportive reactions to emotion. Thus, as with parents, preschool teachers' behavioral and emotional encouragement or discouragement of specific emotions may assist the child in learning appropriate social-emotional behaviors.

In addition, these findings can also augment current views on teachers' role in setting an emotional climate in the classroom (Hamre & Pianta, 2005). Teachers' supportive and acknowledging (validating) responses to children's emotions may create a positive classroom climate for children. For example, children's time spent in a warm and safe classroom may, over time, result in less negative and aggressive interactions with peers. By providing supportive reactions, whether suggesting a way to solve an emotion-eliciting problem or comforting a negatively aroused child, a teacher may be teaching children a better way to handle frustrating situations. If a teacher tends to respond to children's emotions with dismissing and punitive ways, the teacher may create a negative climate conducive to reductions in children's emotionally positive/socially skilled behaviors over time.

Somewhat surprising findings were that (1) children displayed less negative social-emotional behaviors at T2 relative to T1 when they had teachers who displayed more unsupportive reactions to emotion, (2) children displayed more negative social-emotional

behaviors at T2 relative to T1 when they had teachers who employed more supportive reactions to emotion, and (3) children displayed less emotionally regulated behaviors at T2 relative to T1 when their teacher tended to validate their emotions. The combined impact of teachers' unsupportive and supportive reactions on children's emotionally negative/aggressive behaviors, however, can be explained by the social cognitive theory (Bandura, 1989). As opposed to the dyadic nature of parent-child interactions, in the classroom context, children have an opportunity to observe a teacher-child emotional exchange without being involved in the interaction. For example, a child may observe the teacher responding punitively to another child's aggressive behavior. Through this observation, the first child may learn that the teacher will punish aggressive behaviors. Based on this learning, the child's probability of exhibiting aggressive behaviors may be decreased. Similarly, if a child witnesses a teacher trying to help a sad child by comforting or offering a solution to the problem (supportive reactions), it may increase a chance of their exhibiting sad emotion to get the teacher's supportive reactions.

Another possible explanation for the positive relation between teacher supportive reactions and children's negative/aggressive behaviors may be explained through the examination of the function of supportive reactions. In particular, supportive reactions included teachers' helping behaviors by providing a strategy for either solving an emotion-eliciting problem or making the child feel better. Teaching strategies to an emotionally aroused child without calming him/her down, however, may not be effective to reduce negative/aggressive behaviors.

As for teachers' validating reactions negatively related to children's emotionally-regulated behaviors, this finding could also be related to the behaviors included in our observational measure of children. In the MPAC observation system, emotionally regulated behaviors are defined as the child promptly verbally expresses feelings arising from a problem situation, then moves on to the same or a new activity. Thus, in this definition, first, an observer needs to witness the child faced with some frustrating situations (e.g., conflict with peers). Then, the child needs to verbally express how he/she feels in the response to the situation. So it is possible that teachers' validating reactions may, over time, promote a reduction in the number of conflicts between children in the classroom. Because conflictual incidents are the prerequisite for emotionally-regulated behaviors to be coded, a reduction of conflict may explain the relation between teachers' more validating reactions and decrease of children's emotionally regulated behaviors.

Interaction between temperamental surgency and teacher contingent reactions

Consistent with the framework of bioecological model (Bronfenbrenner & Morris, 2006), our findings showed the significant interactions between the proximal process (i.e., teacher-child interactions) and child characteristics (i.e., temperamental surgency) on social-emotional development. Our findings indicated that low-surgency children were more sensitive to both positive and negative types of teacher reactions, compared to high-surgency children.

Then, the question is why teacher contingent reactions to children's emotions have a different impact on development of social-emotional behaviors depending on the level of their temperamental surgency. This finding may be explained by the different behavioral and physiological tendency between low- and high-surgency

children. Because children with low surgency tend to spend more time observing rather than interacting with other people in a novel situation (Kagan et al., 1998), they are more likely to learn from teacher's socialization behaviors, even when they are not directly involved in the interactions. In addition, low-surgency children may be more vigilant and sensitive to teacher socialization behaviors in the classroom because of heightened anxiety they experience in novel situations (Hipson & Séguin, 2015; Kochanska, 1997). In contrast, high-surgency children have tendency to be more impulsive, seek high intensity pleasure, be more active, and less shy, compared to their peers (Rothbart & Bates, 2006). Thus, these children may be too busy in ongoing activity and social interaction in which they are directly involved, and less likely to be aware of teacher-child interactions in surrounding environment. Because they are not observing how teacher is responding to other children's emotions, it is possible that high-surgency children are less likely to be affected by teachers' response to other children's emotions.

Implications

Our study highlighted the significant role preschool teachers play as socializers of young children's social-emotional development. As with parents, the way teachers react to children's emotions conveys a specific message of appropriateness/inappropriateness of their social-emotional behaviors in the classroom. Furthermore, the effect may be not limited to the child to whom the teacher directly reacted; other children, especially low-surgency children, may also be learning about social-emotional behaviors through observing interactions between the teacher and their classmates. Thus, when a teacher reacts to a child's emotion in the classroom, she/he needs to be aware that these reactions may have an impact on other children in the classroom.

The findings of the present study can provide specific recommendations of how to respond to children's emotions in the classroom for preschool teachers. Overall, use of constructive types of reactions to children's emotion seems to be more beneficial to development of social-emotional competence, rather than unsupportive types. For example, if a teacher shows empathic reactions by acknowledging a child's frustration for not getting a favorite toy, then the teacher is not only helping the child reduce the frustration but also modeling empathic behaviors to other children in the classroom. Similarly, children in the classroom may learn a specific strategy to solve conflicting situations by observing how the teacher helps their classmate's conflict. In addition to teaching children positive social-emotional behaviors, these discrete emotion socialization behaviors will promote emotionally supportive environment in the classroom.

Although children whose teachers showed more unsupportive reactions decreased negative/aggressive behaviors, we do not recommend this type of reactions to be used in the classroom. If a teacher constantly yells at an angry/aggressive child, the likelihood of future aggressive behaviors of the child (and other children observing the interaction) may decrease to avoid the teacher's angry reactions. However, the reduction of aggressive behaviors may be context-specific (i.e., to avoid angry reactions from the teacher), and not be generalized across contexts where the teacher is not present. Furthermore, unsupportive reactions will not help children alleviate a negative emotion (Eisenberg, Spinrad, & Smith, 2004), model them empathic responses, or teach them appropriate strategies to deal with frustration.

We found moderation effects of surgency on the relations between types of teacher reaction to emotion and child social-emotional behaviors. However, we are unable to conclude whether the differences between low- and high-surgency children are due to observational learning or direct socialization. Thus, our recommendations above are made as general teacher socialization-practices, and not specific to children with a certain temperamental characteristic. Based on the parental socialization literature (Gallagher, 2002; Rothbart & Putnam, 2002), it can be assumed that children with different temperamental characteristics may respond differently to teacher socialization in direct interactions. To make further recommendations on how teachers should differently interact with children with different levels of surgency, further research is needed.

Limitations and future directions

Although the present study provides a unique contribution to the burgeoning literature on preschool teacher emotion-socialization as it relates to children's development of social-emotional competence, there are several limitations to be addressed. First, we observed teacher emotion-socialization behaviors to *any children* in the classroom, rather than the teacher and a specific child. Thus, unlike parental emotion-socialization research in which socializers' behaviors were mainly examined in child-parent dyadic interaction, we were not able to make any conclusions whether the relations between teacher emotion-socialization behaviors and child outcomes were due to a direct interaction or observational learning. Thus, in future studies, it will be beneficial to include observation of dyadic interactions between a teacher and specific children in the study. With such data, the findings can provide further suggestions of whether teachers need to use different socialization techniques based on temperamental characteristics when directly interacting with children. Also, in the present study, we examined a unidirectional influence from teachers' socialization behaviors to children's social-emotional behaviors; however, teachers' socialization behaviors in the classroom may be affected by children's behaviors. Therefore, examining directional influences between teachers and children will be beneficial for further understanding of emotion socialization in the preschool context.

Because the variance explained by the classroom level was very small for emotionally regulated behaviors, the findings regarding this outcome should be interpreted with caution. This finding may be the result of narrowly defining emotionally regulated behaviors in our observation measure. Our specific definition of children's emotionally-regulated behaviors (i.e., a prerequisite of witnessing a frustrating situation by an observer, and child verbal expression of their frustration in neutral or positive manner) may be too narrow to capture broader aspects of children's emotion regulation ability. For example, if a child regulates emotion internally without verbally expressing his/her frustration, regulation is not coded. Thus, it is recommended to include a wider definition of emotion regulation in future studies.

In addition, although we have a sufficient sample size for the teacher level to have unbiased estimates of the level standard errors (Level-2 sample size of > 50 is suggested in Maas & Hox, 2005), the number of children in each group is small (range 1–5 children per group). Therefore, a replication study with a larger group size is warranted.

Lastly, children's behaviors were observed only in the preschool context, so we cannot be certain that the changes in social-emotional

behaviors occurred outside of the preschool (e.g., home, neighborhood playground). For example, children may have learned not to yell in the classroom through their teacher's negative reactions to such behavior. However, children may or may not generalize this "not yell" rule in other contexts. Thus, in addition to the preschool context, observing children's social-emotional behaviors in various contexts is recommended to examine "carry-over" effects of teacher emotion socialization. With the observational data in various contexts, we can examine whether the changes in children's behaviors in the preschool can also be observed outside of the preschool.

Conclusion

Young children's social-emotional competence is crucial for their concurrent and future social adjustment, school success, and well-being. In addition to parental socialization, researchers, practitioners, and policy-makers are increasingly focusing on a teacher's role as a socializer of children's social-emotional competence. To complement research examining how global ratings of emotional environment a teacher creates in the classroom relate to child outcomes, our study provided first empirical evidence that teachers' discrete socialization behaviors have a significant impact on children's social-emotional behaviors with peers in the preschool context.

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